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ABSTRACT

A study examined the effects of literacy in a Roman alphabet on the performance of Hmong refugees in a three-month program of English as a second language (ESL) and cultural orientation located in Thailand. Upon registration, information was gathered from program participants on previous education and reading ability in Hmong. The 114 subjects were divided into groups according to the lack or presence of formal education and the lack or presence of Hmong reading ability. On program completion, subjects who had remained in the program (N=62) were tested on English comprehension, reading, and oral production and on Hmong reading and writing. Results indicate that literacy in any language had a major effect on the subject's performance on the ESL tests, suggesting that lack of classroom experience is not as large a handicap as lack of literacy skills, as is often assumed. Non-literate subjects appeared to learn little, if anything, from the program. Subjects who could read Hmong without formal education did not score significantly lower on the tests than those with formal education. Among subjects with formal education, those who could read Hmong performed significantly better overall than those who could not. Programmatic implications of the findings are discussed. Appendixes include sample data sheets and test papers as well as statistical analyses. (MSE)

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ED299829

HMONG LITERACY, FORMAL EDUCATION, AND THEIR EFFECTS ON PERFORMANCE IN AN ESL CLASS

Barbara Robson

INTRODUCTION

The purpose of this paper is to report the findings of a research project conducted with Hmong subjects in Ban Vinai, the Hmong refugee camp in Loei Province, Thailand. The project was funded by the Asia Foundation, at the request of the U.S. Department of State; its goal was to determine the effects of Hmong literacy in a Roman alphabet on student performance in a three-month English as a second language (ESL) and cultural orientation (CO) program.

The research project centered on one three-month cycle of a program run by a consortium consisting of the Experiment in International Living, World Education, Inc., and the Save the Children Federation. This program, like others set up in refugee camps in Southeast Asia in 1980-81, was funded by the United Nations High Commission for Refugees (UNHCR) and was to teach intensive survival English and cultural orientation to life in America to refugees who had been accepted for resettlement in the United States. Refugee students in the ESL/CO program were registered for the research project at the beginning of January 1980; at the end of the program they were tested in various aspects of English. The progress of students who were able to read Hmong at the beginning of the program was compared with the progress of those who were not; an additional variable--whether or not the student had had formal education--was also studied.

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In Downing, Bruce and Douglas Olney, eds. The Hmong in the West. Minneapolis, MN: Center for Urban and Regional Affairs, U. of Minnesota, 1982

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REGISTRATION AND TESTING AT BAN VINAI

Registration in January 1981

The relevant cycle of the Consortium's ESL/CO program started in January, and we had obtained permission to test the refugees who signed up for classes. I was, accordingly, at Ban Vinai January 12th-16th, the week that registration for the classes took place.

Students registered for the ESL/CO program by filling out (or having one filled out for them) an information card, and by taking a very simple placement test, in which their knowledge of English and their ability to write in Lao, Hmong, Thai or English was roughly judged.

As the students finished registering for the ESL/CO program, they registered for this project. In addition to collecting enough information so that the student could be located afterwards, I asked for information on previous education. Had the student been to school before? Where? And for how long? Could the student read Lao? Could the student read Hmong?

I also gave a simple test for ability to read Hmong: passages of differing levels of difficulty were read aloud by the student, whose performance was given a score by the interviewer.

The data sheets and the Hmong reading tests had all been prepared and translated in advance, with assistance from fellow Center for Applied Linguistics staff member Cheu Thao.

All the interviewing was done in Hmong, by Hmong assistants whom I had trained both to collect the personal data and to give and score the reading tests. One of these assistants, Vue Tcher, was a teacher in the Hmong literacy program. The information he provided with regard to giving and scoring the Hmong reading test was invaluable; and his

presence, indicating as it did support for the project on the part of a person of relative prestige at Ban Vinai, assured the collection of more accurate personal data than Hmongs typically give to outsiders.

A sample data sheet (with interlinear translations) is given in Appendix A. All together, 114 subjects were registered. Subsequent analysis of the data sheets showed that the subjects could be grouped according to the presence or absence of formal education, defined as education in a school in Laos, and according to the presence or absence of the ability to read Hmong. (We tested only in RPA, the Roman alphabet that is taught in the Hmong literacy program at Ban Vinai and is used--to the near-virtual exclusion of all other alphabets--by Hmong refugees in western countries. The other alphabets for Hmong taught at camp are all non-Roman.)

The 114 subjects divided into groups as follows:

A. -Education, -Hmong literacy: 48
B. -Education, +Hmong literacy: 12
C. +Education, -Hmong literacy: 25
D. +Education, +Hmong literacy: 29

The existence of subjects who had never been to school but who could read Hmong, as opposed to those who had been to school but who could not read Hmong, has allowed testing for the effects of native-language literacy separate from the effects of previous formal education--something very few literacy studies have been able to do, as literacy is virtually always a result of formal education.

The Consortium's ESL/CO Program

The January-April cycle of the Consortium's program turned out to be the last offered at Ban Vinai; the Hmongs were not signing up to go to the United States in any great numbers, and attendance in the December-March cycle of classes had been sporadic, so it was decided to move the consortium program down

to the refugee processing center in Chonburi. At the end of March, therefore, the majority of Consortium staff moved, leaving a skeletal crew of administrators and teachers behind to finish out the January-April cycle.

The 114 registrants were divided into classes according to level of English, as determined by the oral English part of the placement test. Beginning students were further subdivided according to level of literacy as determined by their performance on the writing part of the placement test. Six classes were formed: two low beginning (non-literate students with no English), two high beginning (students literate in something, with no English), one intermediate and one advanced. I was told in April that the intermediate and advanced classes turned out to be quite similar.

The classes were taught by American teachers with varying amounts of experience and formal training in ESL; these teachers were supervised by two master teachers. There were three Hmong aides.

I explained the broad outlines of my project to the teachers and administrators while I was there, but did not go into detail; I also did not share with them the information on each subject that I had collected, although I transferred scores from their placement test to my data sheets. The Consortium staff therefore did not know how I was grouping their students, and their grouping of students did not correlate with mine, based as it was primarily on level of English, a criterion I ignored.

Testing in April

The January-April cycle was scheduled to end April 17th; I therefore arranged with the Consortium administrators to conduct tests the week of April 13th-17th, having gone up to Ban Vinai on April 10th to make arrangements and train monitors. The Consortium's master teacher Erica Hagen and I conducted the testing; we gave the tests to two Consortium classes

at a time; testing took an entire morning or afternoon. We tested the low beginning classes Monday morning; the high beginning classes Tuesday morning; and the intermediate and advanced classes Wednesday afternoon. I am fairly confident that there was no passing of information about the tests from class to class; testing classes in order from low to high ensured that students who had the tests first did not take enough of the tests to pass on useful information to the students in higher levels.

Each student took five tests: English comprehension, English reading, English oral production, Hmong reading, and Hmong writing. Samples of the tests are presented in Appendix B. The English comprehension, English reading, and Hmong writing tests were administered to the students in groups, with close monitoring by English-speaking Hmong aides. The English oral production and Hmong reading tests were given to students one by one.

1. The English Comprehension Test. We gave the Ann and Ben Listening Test, a test developed by the Oregon Indochinese Refugee Program. This test was designed to circumnavigate the special problems inherent in testing non- or newly-literate ESL students. It utilizes visuals, simple line drawings which are taught to the students in their native language as an integral part of the test (which eliminates cross-cultural problems in interpreting visuals). The test is multiple-choice: an English sentence is read out loud by the test-giver, and the student must mark one picture of three which best corresponds to the sentence. The student is not required to read or write in order to answer questions correctly. The test is three-part: the first part teaches the student how to mark the pictures, reiterating in English the material about the visuals that has been taught in the native language. The second part requires the student to choose a correct picture among alternatives, but includes only one sentence the student has not previously had explained in the native language. The third part presents all new test material.

Erica Hagen gave the comprehension test to all classes. All students took the first two parts. The intermediate and advanced classes took part III as well. The recorded score for a particular subject consists of his or her score on parts II and III; a score of 40 or more indicates that the subject got one or more correct answers on material that had not been previously explained or translated. Throughout the test, students were carefully monitored, to prevent "cheating," and to make sure that everyone was marking the appropriate set of pictures and turning the pages at the right time and so on.

2. The English Reading Test. The reading test was an adaptation of the Ann and Ben Listening Test and utilized the same visuals and format. The reading test was in all cases given immediately after the comprehension test, so the students would not have time to forget what the visuals were about. The test was in three parts and differed from the listening test only in that the student had to read the sentences rather than listen to them; the student did not have to write English in order to answer a question correctly. While the same English content was tested in the comprehension and reading tests, and the same visuals were used, the actual test items differed from the comprehension to the reading test.

I gave the reading test to all classes. Students were allowed to work through the three parts of the test at their own speed. They were also allowed to decide whether they wanted to take parts II and III; almost none of the low beginning students got past part I, whereas all of the intermediate/advanced students took all three parts. Instructions for the test were given in English, then translated into Hmong, and the students were monitored by the Hmong aides.

An individual subject's score on the reading test is the sum of his or her scores on all parts of the test. Any score higher than zero indicates that the subject read and understood material that had not been previously explained or translated.

3. The English Production Test. This test consisted of a pretest, in which the students were asked questions they had been taught in class (e.g., What's your name? What's your T-number?, etc.) and the John Test, a standardized oral production test widely used in refugee programs in the United States. The John Test utilizes a series of pictures, about which the student is asked questions. For the purposes of the Ban Vinai testing, some of the questions were altered to eliminate cultural problems.

I gave the pre-test individually to all the students. Those who did fairly well on it were given the John Test as well. The students were told beforehand, in Hmong, that they were going to be given an oral interview, but other than that the test was conducted entirely in English.

On the pre-test, the student got a point if he or she understood the question, another point if an answer was forthcoming, and a third point if I could readily understand the answer. I did not distinguish between grammatical and ungrammatical responses. On the John Test, the student got one point for an understood question, and another point for an understandable answer, with no distinction again being made between a grammatical and an ungrammatical response. I gave only the first part of the John Test. Any score above zero on the production test indicates that the subject managed to at least understand something said to him in English.

4. The Hmong Reading Test. This test was identical to the simple reading test given in January, except that the passages were different. Vue Tcher and Tou Vue gave the test to students one at a time, with the test conducted entirely in Hmong. A score close to thirty indicates that the subject could read out loud fluently, with no hesitations. A score of ten or below indicates that the student could decode the written material, but with great difficulty.

5. The Hmong Writing Test. This test was in three parts: the first part required the student to

write his name in English and Hmong spelling; his T-number, and his address in camp. The second part consisted of dictation of letters and numbers in Hmong. The third part consisted of dictated sentences in Hmong. The test was given to all students, in groups, by Vue Tcher, with Hmong monitors checking student progress and answering questions. A raw score of 2 1/2 indicates that the subject was able to write his or her name in English spelling.

6. Testing Sites. The students were tested in the classrooms used by the Consortium. These classrooms were structures of bamboo and thatch (we were lucky it didn't rain during any of our testing), with wooden benches and tables for the students to sit at. All the classes had blackboards, which we used in teaching the visuals for the comprehension test. The students were packed rather tightly into the classrooms, but there was a minimum of sharing of answers: we had carefully explained that we did not want them to share answers, and they good-naturedly complied with our request, with occasional reminders from the monitors.

7. General Comments. All the tests had been planned, assembled, proof-read and briefly field-tested in the United States between January and April. At Ban Vinai prior to the week of testing, I gave the tests to Vue Tcher, Tou Vue and some of the Hmong aides, to double-check for appropriateness and consistency. It was on the basis of this testing that I altered some of the questions on the John Test.

Erica Hagen, Vue Tcher and I corrected the tests we gave, but we deliberately did not record the scores on the data sheets until all the testing had been completed; none of us knew which students were in which cell until everyone had been tested.

It was necessary, in planning the tests, to arrive at instruments which would register very small gains in English, but at the same time be difficult enough to differentiate among the performances of the more advanced students. In retrospect, the tests appear to have been ranged just right for the

population tested. On a "standard" ESL scale, however, the best of the subjects would be called a high beginning or low intermediate ESL student.

ANALYSIS OF DATA

Membership in Groups

The 114 Hmong refugees who originally registered for classes in January were by no means the same group of refugees who completed the course, and therefore got tested, in April.

We tested everyone in the Consortium classes, for two reasons. We did not want to sort out subjects from non-subjects prior to the testing because that would have involved re-discovering who was in which group. More important, attendance or non-attendance in the Consortium's program was closely tied, by rumor and fact, into a refugee's chances of going to the U.S. in the first place, and his having to attend an additional three-month ESL/CO program in the refugee processing center in Chonburi in the second place. There is no way we could have convinced the refugees that our testing, or lack thereof, was not related to their chances of going to the U.S., so we were reluctant to exclude anyone from testing.

For the same reason, we were reluctant to find and interview subjects who had registered in January, but who had dropped out of the program between registration and the last week of classes. In recording the test scores on the data sheets, we discovered that fifty-two of the original registrants for the program had dropped out. The dropout rate was consistent across groups, so we feel that it was not related to the variables we were testing. Information on the numbers registering and finishing the program is summarized in the following table:

	Group	Registered	Finished Program	Percent Dropped
A.	-Ed, -HLit	48	27	43.75
B.	-Ed, +HLit	12	6	50.00
C.	+Ed, -HLit	26	16	36.15
D.	+Ed, +HLit	27	13	51.86

The dropout rate, then, cut the number of individuals in the original groups by about half. We lost a subject or two for other reasons: one little girl turned out to be, not the not-so-little girl who had registered, but her little sister, and so on.

Another factor that reduced the number of subjects in the groups was the number who showed by their performance on the Consortium's placement test that they knew some English before they entered the program. I eliminated all these from the groups because I was not equipped to measure improvement, the Consortium's placement test not being sufficiently detailed or controlled to be used as a before-and-after proficiency test.

The majority of subjects who had picked up some English prior to the program were almost all from the +Ed groups: eight in group D (+Ed, +HLit), six in group C (+Ed, -HLit), one in group A (-Ed, -HLit), and none in group B (-Ed, +HLit).

These factors left the following numbers in each group:

A. -Ed, -HLit: 23
B. -Ed, +HLit: 6
C. +Ed, -HLit: 10
D. +Ed, +HLit: 5

Statistical Analyses[1]

I examined the effect of Hmong literacy and education on each of the English tests separately and on the overall English score (the average of the three tests) by means of a two-way analysis of variance. As the table below shows, Hmong literacy and education both significantly increase scores. As the table also shows, there is no consistently significant interaction between the two variables.

Effects of Hmong Literacy and Education on English Test Scores

Test	Overall Mean	Variable	Significance (df = 1)
English Comprehension	44.38	Education	F=112.70; PR>F .0001
		Hm Lit	F= 28.44; PR>F .0001
		Ed/Hm Lit	F= 6.80; PR>F .0128
English Reading	30.75	Education	F= 44.11; PR>F .0001
		Hm Lit	F= 24.22; PR>F .0001
		Ed/Hm Lit	F= .07; PR>F .7857
English Production	23.79	Education	F= 40.57; PR>F .0001
		Hm Lit	F= 22.78; PR>F .0001
		Ed/Hm Lit	F= .23; PR>F .6363
Overall English	'32.93	Education	F= 91.42; PR>F .0001
		Hm Lit	F= 38.14; PR>F .0001
		Ed/Hm Lit	F= .45; PR>F .5064

I also conducted additional tests (one-way analyses of variance) to determine which of the groups differed significantly from which others. The scores of group A (-Ed, -HLit) differed significantly from the scores of all other groups on all tests (p. .01). The overall English scores of group D (+Ed, +Lit) differed significantly from the overall English scores of group C (+Ed, -HLit), as did their scores on the English Production test. In Appendix C, the outcomes of these statistical tests are given.

Interpretation of Outcomes

The most obvious of the findings of this study is that literacy in any of the languages produced a major effect on the subject's performance on the ESL tests. The ability to read helped the subjects in their efforts to learn another language. While this will come as no surprise to any ESL teacher who has dealt with non-literates, it is usually thought that lack of experience in a classroom environment is as big a handicap as lack of literacy skills. The findings of this study suggest that it is not.

An analysis of the actual performance of the non-literate subjects shows that they learned very little, if anything at all, from the program. A look at the test papers in Appendix B is illustrative: Wang Pao has the second highest average in group A, but his test papers show that he managed only to tell me his name and T-number in face-to-face questioning; to understand ten simple sentences; and to read five simple English sentences, four of which he could have remembered from previous discussion in Hmong. His performance on the English production test is the most thought-provoking, as it was this test that comes closest to situations for which the program prepares students, and as the questions had been overtly taught in class.

A second finding of this study is that the subjects who could read Hmong but who had never been to school did not score significantly lower on the tests than did those who had had formal education. Literacy in Hmong provided subjects with as much of a "leg up" in their efforts to learn English as formal classroom experience did. It is impossible to tell whether the advantage that Hmong literacy provides is in native-language literacy, or in literacy in a Roman alphabet similar to the English alphabet. A parallel study done with subjects whose native language is written in a non-Roman alphabet (e.g. Khmer or Lao) would shed light on this question. If it turned out that native language literacy was the crucial factor, and not the alphabet, the hypothesis

forwarded in some of the literature on literacy that native language literacy focuses overt attention on language structure, would be fairly strongly supported by this study. On the other hand, ESL teaching experience provides massive support for the hypothesis that familiarity with a Roman alphabet is of value to students attempting to learn English; it clearly gives them one less thing to learn.

The third finding of this study is that among the subjects with formal education, those who could read Hmong scored significantly better overall than those who could not. Assuming that the significance is real, and not an artifact of the small number of subjects, native language literacy is of significant help to Hmongs learning English whether or not they have formal educational backgrounds. Again, it is impossible to tell whether the advantage the Hmong literates possess is in native language literacy or in familiarity with a Roman alphabet.

This study was of course done in the context of the Consortium ESL/CO program, which in its ESL aspects did not differ to any great extent from most other classroom ESL programs. I am assuming that in eliminating individuals who had learned some English prior to the Consortium program from the subject lists, I de facto eliminated individuals who were motivated to, and able to, pick up English from self-study, contact with English-speakers in camp and in Laos, or study with other Hmongs. (In fact, some of the best non-native English spoken in camp -- notably that of Vue Tcher and many of the Hmong aides who helped give the tests -- had been learned informally.) The findings of this study, then, apply only to the effects of literacy and education on attempts to learn English in a formal classroom environment.

PROGRAMMATIC IMPLICATIONS OF THE STUDY

As I mentioned before, the Consortium ESL/CO program around which this study was done is one of the programs funded by the UNHCR to provide English

and orientation to Indochinese refugees who have been admitted to the United States. The curricula of these programs is standard, and very much oriented towards meeting the practical linguistic and cultural needs of the refugees as they deal with life in the United States. Although non-literate students turn up in these programs in sizable numbers, native language literacy is not part of the curricula, as it is thought to be not as valuable to the student as ESL, especially in so short-term a context.

While this study strongly supports a programmatic approach in which Hmong students are taught literacy in Hmong as a preliminary to ESL, it provides no information per se as to whether non-literate Hmongs will learn more English in a short-term program, a portion of which is devoted to Hmong literacy, as opposed to a program of the same duration which teaches only ESL.

If the fact that the non-literate subjects in the study learned little or nothing in the Consortium program is taken into account, however, the study suggests that any alternative program design can produce at least equal or better results with non-literate students; it then supports a program in which Hmong literacy training substitutes for some of the ESL.

Consideration of the performance of the non-literates in this study also suggests that it might be useful to test non-literates in all the United Nations-funded programs, both for achievement and for English proficiency as determined by non-program oriented tests. If all non-literates learn as little from the three-month ESL programs as did the ones in the Consortium program, the overall program design is suspect. If the non-literates perform differently from program to program, however, this would indicate that the programs differ in their ability to reach the non-literate student.

The implications of this study as to the value of native-language literacy can be extended to ethnic groups other than the Hmong, as long as the native

languages of these groups are written in Roman alphabets, and as long as the Roman alphabets are recognized by the groups as viable alphabets for their languages. It would for example be hard to tell whether non-literate Mien refugees would benefit from Mien literacy training (in the Roman alphabet designed for Mien by missionaries) prior to English language training, unless it was determined beforehand that that alphabet was generally accepted by the Mien as "their" alphabet.

It is hardly necessary to point out that this study, despite the very strong statistical validity of the results, is at best a pilot because of the small number of students used in the statistical analysis.

NOTE

1. I am indebted to a Center for Applied Linguistics colleague, Dr. Sylvia Scribner, and to Dr. Steve Reder of the Northwest Regional Education Laboratory for their help in the statistical analyses.

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(data sheet)
NTAWV NUG NOO

#452002 A

Steve

(Name) Npe WANG PAO (in English) (Sau ua Askiv) Wangpao (Sau ua hmoob) (in Hmong)

(Clan) Xeem Hmua (age) Hnub nyoog 20 (f) Poj niam _____ (m) Txiv neej ✓

Chaw nyob hauv chaw so Vib Nais (address in Ban Vinai) _____

Koj muaj poj niam/txiv lawm los tsis tau ? (Have you been married?) Muaj lawm (yes) ✓ Tsis tau muaj (no) _____

Koj tus poj niam/txiv lub npe hu licas ? (What is your spouse's name?) E _____

Koj puas tau kawm ntawv los dua ? (Have you been to school?) Tau _____ (yes) Tsis tau (no) ✓

Yog tau, nyob qhov twg ? (If yes, how long) _____

Kawm tau hov ntev ? (where) _____

Koj tuaj so hauv chaw so Thaib teb tau hov ntev lawm ? (How long have you been in Thailand?) 3 xyoos

(reading) Kev nyeem ntawv:

(Can you read Hmong) Koj nyeem ntawv hmoob puas tau ? Tau ___ Tsis tau ✓

ตามตามมาตาวะเป็นบ่ ? (Can you read Tao?) ตามะเป็น _____ ตามบ่ะเป็น ✓

Txhoh sau dabtsi rau hauv no (Score on reading test)

Score: ___ H _____ M _____ L

0 0 0
[SCORE ON CONSORTIUM PLACEMENT TEST]

Test scores: (Txhoh sau dabtsi rau hauv no)

ENG: 40 + 30 47% Comp 5 + 20 13% Reading

16 9% Prod _____ Writing

HM: ~~Mr~~ 0 0 Reading

2½ 7% Writing

ANN & BEN LISTENING TEST

FORM B

Name Wrong Pax

T. No. _____

Address _____

30

ANN & BEN LISTENING TEST

FORM C

-17

(40)

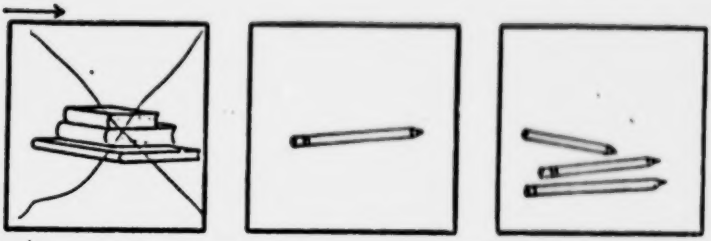
Wang poo

Name Wang

T. No.

Address

1.



2.

3.

19

Ann and Ben Reading Test

Form A

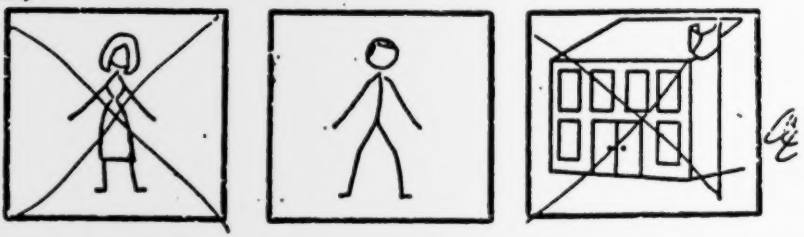
Name Lulpo _____ _____

T-No. ____

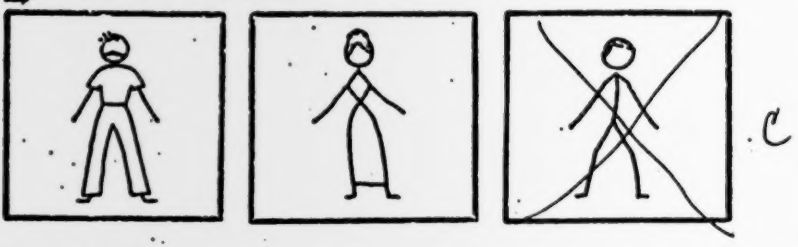
Address

20

1. This is Ann. She's a student.



2. This is Ben. He's a student.



3. She's a teacher.

20

The Ann and Ben Reading Test

Name [redacted] wugpao

FORM B

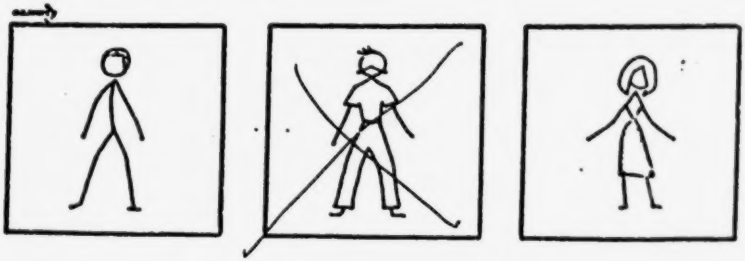
3

T. No. _____

Address _____

1. She's a teacher.

2. This is Ben. He's a student.



21

Oral Production Pre-test

Name V. P.

T-Number

Address

4/27

Questions	Score			
1. What's your name?	0	1	2	(3)
2. How do you spell it?	(0)	1	2	3
3. What's your T-number?	0	1	2	(3)
4. What's your address on camp?	(0)	1	2	3
5. Are you married?	(0)	1	2	3
6. What's your husband's / wife's name?	(0)	1	2	3
7. How do you spell it?	(0)	1	2	3
8. Do you have children?	(0)	1	2	3
9. How many children do you have?	(0)	1	2	3

Total score: 6

0: didn't understand question
1: understood, no verbal answer
2: understood, verbal answer
3: understood, correct verbal answer

22

Npe WANGPAO _____ (Sau ua Askiv)

_____ (Sau ua Hmoob)

T-number _____

Chaw nyob hauv chaw so Vib Nais _____

Sau cov niam ntawv thiab cov leb:

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Sau raws li tus xib fwb hais:

_____

_____

_____

_____

_____

Scores: Recognition _____ Dictation _____

0&6 [score on Hmong reading test]

APPENDIX C: STATISTICS

ONE-WAY ANALYSES OF VARIANCE

Group A (-Ed, -HLit)/Group B (-Ed, +HLit)

$df_1 = 1$; $df_2 = 27$; $F_{.01,1,27} = 7.68$

Test	Means	F	Significant?
English Comprehension	A: 37.61 B: 93.33	32.37	Yes
English Reading	A: 15.22 B: 85.00	19.09	Yes
English Production	A: 10.22 B: 19.67	10.85	Yes
Overall English	A: 14.97 B: 42.83	30.44	Yes

Group A (-Ed, -HLit)/Group C (+Ed, -HLit)

$df_1 = 1$; $df_2 = 31$; $F_{.01,1,31} = 7.53$

Test	Means	F	Significant?
English Comprehension	A: 37.61 C: 114.50	130.14	Yes
English Reading	A: 15.22 C: 93.00	27.94	Yes
English Production	A: 10.22 C: 20.90	29.97	Yes
Overall English	A: 14.97 C: 49.10	81.10	Yes

Group A (-Ed, -HLit)/Group D (+Ed, +HLit)

$df_1 = 1$; $df_2 = 26$; $F_{.01,1,26} = 7.72$

Test	Means	F	Significant?
English Comprehension	A: 37.61 D: 131.00	119.20	Yes
English Reading	A: 15.22 D: 171.00	289.75	Yes
English Production	A: 10.22 D: 32.40	78.53	Yes
Overall English	A: 14.97 D: 71.33	290.83	Yes

Group B (-Ed, +HLit)/Group C (+Ed, -HLit)

$df_1 = 1$; $df_2 = 14$; $F_{.01,1,14} = 8.86$

Test	Means	F	Significant?
English Comprehension	B: 93.30 C: 114.50	2.39	No
English Reading	B: 85.00 C: 93.00	.05	No
English Production	B: 19.67 C: 20.90	.10	No
Overall English	B: 42.83 C: 49.10	.47	No

Group B (-Ed, +HLit)/Group D (+Ed, +HLit)

$df_1 = 1$; $df_2 = 9$; $F_{.01,1,9} = 10.56$

Test	Means	F	Significant?
English Comprehension	B: 93.30 D: 131.00	4.43	No
English Reading	B: 85.00 D: 171.00	7.21	No
English Production	B: 19.67 D: 32.40	5.94	No
Overall English	B: 42.83 D: 71.33	8.19	No

Group C (+Ed, -HLit)/Group D (+Ed, +HLit)

$df_1 = 1$; $df_2 = 13$; $F_{.01,1,13} = 9.07$

Test	Means	F	Significant?
English Comprehension	C: 114.50 D: 131.00	2.21	No
English Reading	C: 93.00 D: 171.00	6.73	No
English Production	C: 20.90 D: 32.40	13.14	Yes
Overall English	C: 49.10 D: 71.33	9.48	Yes